



GIS Strides Ahead in Mapping and Serving Business Needs

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The past few years have seen rapid growth in the technology and applications of geographic information systems (GIS), which let users intelligently analyze geographic and demographic information. Traditionally, companies have used such systems to make decisions about real estate, such as where to acquire property to gain access to customers in certain locations. Would the news room of a national newspaper have any use for GIS technology, though? Those who don't think so might do well to listen to Paul Overberg, database editor of *USA Today* in McLean, Va.



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Overberg says *USA Today* was a pioneer among publishers when it used GIS to analyze the 1990 census data. Since then, the newspaper has used GIS to create maps published in the newspaper and other cartography functions, routing analysis for newspaper delivery and customer targeting in circulation management. "We have tens of thousands of outlets, and an analysis of the sales data there, combined with foot traffic and vehicle traffic patterns, has helped us optimize *USA Today's* distribution," he says. Overberg believes GIS applications will soon extend to areas such as optimizing resources in the flow of materials from one end of the country to the other. The newspaper, which has a daily circulation of 2.1 million, has 35 printing sites throughout the country. "We have thousands and thousands of tons of paper moving through the country every minute of the day," Overberg says, but in the future, GIS could help make that process more efficient.

Clearly, *USA Today's* experience example shows, GIS has come a long way in recent years. Exactly how far will be clear when Overton and speakers from several other companies, present case studies of how GIS and related technologies are transforming their business operations at a symposium in Philadelphia this month. Organized by the Wharton GIS Lab and *Directions* magazine, the symposium, titled "[Location Technology & Business Intelligence](#)," is scheduled to be held on May 10 and 11. The goal, according to its organizers, is to foster a deeper understanding of "how companies have benefited from information systems, business intelligence, and database technology that support geographically referenced data."

As GIS has evolved, so has the mission of Wharton's GIS lab. [Susan M. Wachter](#), director of the [Wharton GIS Lab](#) and [Paul Amos](#), its managing director, say they plan to broaden the lab's canvas by announcing the launch of a new program at the conference: the Wharton Geospatial Initiative. This initiative will embrace not just GIS but also global positioning systems (GPS) and other high-technology applications such as Wi-Fi (wireless fidelity, or an interoperability certification for wireless local area network products) and radio frequency identification (RFID).

The Wharton GIS Lab had organized a similar conference in August 2002. Since then, Wachter says she has seen "a tectonic shift of interest and attention" from large IT firms as more companies recognize the potential and value of GIS. "We wanted coverage of the relevant sectors with the fast-changing nature of GIS applications," she says.

Many companies that are involved with the conference as presenters or sponsors are actively involved in GIS. Among them: ESRI, a leading GIS software developer based in Redlands, Calif.; MapInfo, a provider of business mapping products and solutions based in Troy, N.Y.; SRC, a provider of web-based micromarketing solutions using demographic and geographic information based in Orange, Calif.; and Group 1 Software, a maker of software for business geographic applications based in Lanham, Md. Other sponsors include Oracle, Microsoft, Sun Microsystems and MapQuest.

"Geospatial technology is improving much faster than it did in the past," says Wachter, citing as examples the rapid growth of technologies such as GPS, RFID, Wi-Fi and cell phone location-specific technologies. In addition, until recently, GIS technology applications were seen as a separate component of an organization matrix, where "it would be in its own silo." But now, she notes, businesses are realizing that many of their processes can be made more profitable using spatial technologies to improve efficiencies, especially in marketing functions.

During the past decade, GIS technologies have been used within private industry to support specific challenges within business units. "Now, businesses have begun to understand that within corporate databases there exist vast resources of location intelligence that can be leveraged throughout the enterprise," they say. The data captured by customer addresses or zip codes at the point of sale conveys information not only about the type of purchase but it also provides insights regarding inventory management, logistics and transportation, as well as marketing and sales. "This ripple effect is inherently location-based in many instances and serves as a signal to CIOs and CTOs that location can be an effective strategic weapon," says a background note prepared by the conference organizers.

One of the most important aspects that the conference speakers are expected to address is how all departments within a company can leverage the same data without replicating expenses for software and data acquisition. As GIS applications find uses throughout the enterprise, the thrust will be on the cost-benefits of developing databases that are location "aware," say the conference organizers. "The objective now is to make this interoperable with other enterprise systems such as customer relationship management, human resources and financial management," says Joe Francica, editor and manager of *Directions* magazine, who is the conference chair.

One of the catalysts in the growth of GIS applications in recent years has been the decrease in prices of spatial information, according to Francica. He also points to the "drastic fall" in prices of hardware, especially data storage. Says Wachter of the new affordability of GIS technologies, "The whole concept of supply-chain management and knowing where all the components of the business are, is now technologically feasible and profitable."

Francica says GIS users and suppliers are now drawing together diverse information technology platforms—location technology and IT applications, such as in customer relationship management (CRM), enterprise resource planning (ERP), supply-chain management, field force automation, etc. "A good illustration is the ability for a transportation company, large or small," he says. "With GIS, if they can remove one or two vehicles from their operations or schedule their drivers more efficiently, they could save a lot in gas and personnel costs." Francica's favorite example is of a routing and scheduling system developed by ESRI for Sears. "It is saving them several million dollars a year, net of costs," he says.

Hartwell Hooper, director of market research at CVS Realty Company, a CVS group firm based in Woonsocket, Rhode Island, is an avid GIS user. Hooper, who will present a case study on his company's experience with GIS at the symposium, says the range of applications is growing "almost geometrically." CVS Realty started using GIS around 1999 for initially helping evaluate potential store locations in relation to the street network and competition. Soon after, a formal research department was put in place to provide not just visualization tools but analysis as well.

"Since then, we've been using GIS to understand the characteristics of those areas -- population, density, income and competitor locations -- and also the results of our analysis as to what we see as the 'trade area' of our stores," says Hooper. Other applications have been in advertising, by overlaying trade areas with carrier routes, zip codes and other geography units to buy media.

CVS found that with GIS, it was able to more efficiently select the right newspaper in a given locality to carry its advertising inserts, and also negotiate better terms with those newspaper publishers. "In the Northeast our coverage (of store locations) is so extensive that we didn't have to think," says Hooper.

"But in our newer markets, such as Florida, Texas and Arizona, we had to strategize for advertising, direct

mail and newspaper circulars."

Another long-time user of GIS that will showcase its experiences at the conference is ChevronTexaco. Alan Nunns, general manager of global information technology and strategy at the company's headquarters in San Ramon, Calif., who will present the case study, says ChevronTexaco has used GIS since the early to mid-1990s, mainly in upstream exploration and production operations, especially for dealing with remote sensing, environmental and geological data. Those uses have since grown throughout the company's value chain, and to a limited extent in retailing.

"We are in a business where geography matters a lot," says Nunns. "We need to drill in the right place, need to put facilities in the right place, and need to be very sensitive to environmental concerns. What that means is that we need to correlate different types of data, and GIS is a very powerful tool in achieving that." In his case study, Nunns plans to show how the company uses GIS throughout the company value chain, from drilling to retailing.

To be sure, the GIS Lab is also very active, with numerous projects completed or underway—a staple has been working on projects with private sector developers and the retail trade on site selection. It also has several projects on its plate. In March this year, an Urban Institute was formed at the University of Pennsylvania in a university-wide effort across its 12 schools. The Wharton Geospatial Initiative will promote the study of spatial analytics and its implementation for the business sector as part of the Urban Institute's programs. Wachter, who is co-director of this institute, looks forward to a big boost in resources and opportunities for her geospatial analytics initiative with support from all the university's schools and integration with critical disciplines such as engineering and the university's Fels School of Government.

Another big project is with the William Penn Foundation in Philadelphia, where the Wharton GIS Lab will do a real estate property analysis of between 300,000 and 400,000 residential properties throughout the city. Amos says the study will try to understand how different neighborhoods have performed, and why some have done better than others. This analysis will cover aspects such as home sale prices, parks, property taxes, crime information and related demographics. The study, which is underway for about a year and a half, is being conducted by Wachter, Amos, Kevin Gillen, a doctoral student at the Wharton Real Estate department and Mary DiCarlantonio, a research assistant at the lab. "We are developing neighborhood price indexes from 1980 up to the present," says Wachter, "and working on a data warehouse with the city to update and make available price indices for the city by neighborhood." The study will specifically look at the impact of public investments in the city's commercial corridors, especially on property values and vacant land use and neighborhood transformation initiatives.

Another project at the lab that has been going on for a number of years is for retail chain company Wawa of Wawa, Pa. The lab primarily helps the company select its expansion locations across five states in the Mid Atlantic, but its work extends to much beyond that. "Wawa has departments looking after real estate and demographics, but they weren't sharing it with their marketing department," says Amos, explaining how GIS helped the company derive efficiencies.

"We are at the cusp of a change in terms of the mainstreaming of GIS technology," says Wachter. "We are not there yet. But many things are going on to make that happen."

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